



Background Paper

Committee: World Health Organization

Topic: Genetically Modified Organisms and their Effects on Health and Security

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The UN defines genetic engineering as the ability to manipulate and transform the properties of cells, seeds, microbes, insects, plants, animals, and even humans. With this being set, genetic engineering organisms are being produced, exported, and imported all over the world. Taking into consideration that the most common GMO's are farm animals, crops, and soil bacteria. The consumption of genetic modification and the modification of human cells has been a bilateral topic that should be addressed all over the world.

In the past few years the production of genetically modified organisms has been increasing due to their high expectancy to face the outcoming difficulties which humanity is about to live, such as the lack of food for all human beings (by the year 2050 the world will need 70% more food, and one of the most possible solutions will be the use of GMO's), climate change, and mortal diseases as cancer, VIH, or malaria. On the other hand nations all over the world are concerned about the safety and possible long-term effects that genetically modified organisms could have on the human body since there is no basis that this procedure could be done with 100% accuracy. In addition, religious beliefs strictly interpose to the use and consumption of genetic modified organisms. It is indispensable to act wisely in order to progress as a society.

Throughout history scientists and specialists had been working and learning the right process to create genetically modified organisms. The process has been causing controversy around nations. Scientists started by altering the genomes of plants, animals, or bacteria by replacing some desired traits in order to create a new organism with their new desired properties. In fact, in recent decades scientists

have achieved several genomes transformations in different things. For example, creating sweeter corn with an incrementation on their nutritional properties; or hairless cats or dogs, and even glow in the dark fish which has been a great advance to medical uses; among others.

The organisms which have passed by the process of artificial selection were limited by certain newgenomes. In other words, in past years it was not possible to put together certain genomes' characteristics into organisms that did not have the same natural variations. However, nowadays science has shown that it is possible to add genomes of unrelated organisms into their desired entity. This has created positive effects on agriculture and medicine, such as creating immune plague crops or even the invention of insulin and growth hormones.

Gregor Mendel is recognized as "The father of genetic engineering". By the 19th century, Gregor found out genetic Hybridization (a technique used by specialists in order to detect and analyze the variations on the copy number of the chromosomes), which is considered the first human step that led to genetic engineering. The first genetically modified animal was in 1970, scientists used mice in order to experiment with their DNA, recently this has saved millions of lives. Two years later, Herbert Boyer and Stanley Cohen discovered a new technique known as genetic splicing (a technique to divide DNA). In the United States of America, around the year 1976, this biotechnology started being commercialized to any company, which encouraged companies to start experimenting with the genes of food or chemicals. After years, the U.S Department of Agriculture introduced their first GMO crop; 4 years after they created herbicide crops and introduced them into the market without letting the customers know. In the 1990s was the first intervention of genetic modifications into a human cell. This experiment was applied to an infertile woman. Scientists found out the way to fertilize her with the help of a fertile woman and man, this was the first time that a baby had 3 genetic parents. Nowadays around 70% of almost all food has been genetically modified, it also exists in many genetically modified organisms, such as super muscled pigs, fast-growing salmon, unfeathered chicken or see-through frogs.

Recently, two biochemistry students of the University of California (Berkely) called Doudna and Emmanuelle Charpentier found that a technology named Clustered Regularly Interspaced Short Palindromic Repeats, also known as CRISPR. The use of this new technology has decreased the cost of genetic engineering by 99%. In addition, the use of this technology could be done in one week, and it has the power to create big changes in humanity. CRISPR is used as a way of coping with RNA with the help of an enzyme called CAS9. This will facilitate the procedure of cutting and pasting the RNA to the designated organism, this can be used as a way of protection against the virus. The previous enzyme has

proved that it is 99% effective when they are genetically modifying the DNA. CRISPR offers the ability to modify any type of cell, including; humans, microorganisms, plants, or bacteria. This technology has been used in patients with HIV and gave impacting results, taking away almost 60% of all the viruses.

Brazil, Argentina, India, and Canada, are some of the most popular countries with big growth in GMOs. In these countries, there have been lots of positive impacts and some of them are in genetically engineered foods; resistant plants that require less environmental resources (this includes less use of pesticides), faster-growing animals and plants, greater food supply with reduced cost, and longer shelf life.

Algeria, Madagascar, Zimbabwe, Peru, Venezuela, and Russia. These countries are against GMO. Each country has a negative point of view about GMOs, toxic crops and lands, threat to farmers, less ecosystems areas, not natural or healthy for humans who consume GMO products because it has altered genetic material and 'non-real products'.

GMOs are a worldwide controversial topic that should be addressed as soon as possible. GMOs have had a long trajectory history since 1973 and each year it gets more promising for every type of study. There are different ideologies in GMOs in which each country has different ideas, beliefs, and studies. Nowadays there's a big amount of different GMOs, also it is indispensable to have in mind the history, cultures, religion, and personal beliefs of every nation of the world to reach a common good.

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